Noise Impacts

The INDOT Highway Traffic Noise Policy was approved by the Federal Highway Administration and went into effect on October 15, 1997. INDOT is in the process of revising its noise policy and will release revisions when available. Title 23 of the Code of Federal Regulations Part 772 (Procedures for Abatement of Highway Traffic Noise and Construction Noise) requires a highway traffic noise study for the potential impacts of Type I projects that are proposed in areas with noise-sensitive land. Type I projects are proposed Federal or Federal-aid highway projects that result in 1) the construction of a highway on a new location, or 2) the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment (moves 50% closer to receivers) or that increases the number of through-traffic lanes. A formal noise analysis is not necessary for non-Type 1 projects.

A statement similar to the following should be included in the environmental study: "In accordance with the INDOT Highway Traffic Noise Policy approved by the Federal Highway Administration and effective on October 15, 1997, this action requires no formal noise analysis." For the same reasons, non-Type 1 projects are also exempt from construction noise requirements.

For Type 1 projects, the summary of the noise analysis should include a discussion of expected traffic noise impacts. Impacts occur when the predicted traffic noise levels approach or exceed the noise abatement criteria, or when the predicted traffic noise levels substantially exceed (when predicted traffic noise levels exceed existing noise levels by 15 dBA or more) the existing noise levels. "Approach or exceed" shall mean that future levels are higher than 1 dBA Leq(h) below the appropriate noise abatement criteria (NAC-Table 1).

Table 1. FHWA Noise Abatement Criteria in dBA (hourly A-weighted sound level).

Activity Category	NAC, Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches libraries, hospitals, and auditoriums.

The exterior NAC is to be used in all studies except in cases where no exterior activities are affected by traffic noise. In cases where interior NAC are used, the predictions for interior noise levels can be estimated by subtracting noise reduction from predicted exterior levels using Table 2.

Table 2. Factors to deduct from exterior noise levels.

Building Type	Window Condition	Exterior of the Structure
All	Open	10 dB
Light Frame	Ordinary Sash (closed)	20 dB
Light Frame	Storm Windows	25 dB
Masonry	Single Glazed	25 dB
Masonry	Double Glazed	35 dB

The NAC are applicable to the consideration of traffic noise abatement measures, not to the degree of abatement.

If impacts occur, then noise abatement measures should be discussed, giving weight to the benefits and costs of abatement, and to the overall social, economic, and environmental effects. Specifically the discussion should contain the following:

a. A brief description of noise sensitive areas (residences, businesses, schools, parks, etc), including information on the number and types of activities which may be affected. This should include developed lands and undeveloped lands for which development is planned, designed, and programmed.

b. A description of the existing noise levels for the receivers which may be affected. Existing noise levels, in dBA Leq can be determined using the FHWA prediction model, but only if it is clear that the predominant source of noise comes from a highway. It is preferable that existing levels be determined by measurement with a noise meter in order to account for obtaining the composite noise level from all sources. The noise level should be done at several locations having typical noise levels for the receivers in question. The timing of measurement or prediction should reflect the highest hourly noise levels, which do not necessarily correspond with peak traffic volume.

c. A description of the noise levels expected to occur as a result of the project.

d. The identification and description of traffic noise impacts for each sensitive area. This includes a comparison of the predicted noise levels with both the FHWA noise abatement criteria and the existing noise levels. Where there is a substantial increase in noise levels, the criterion used for defining "substantial increase" should be explained. Use of a table for this comparison is recommended for clarity.

e. Identification of noise abatement measures which have been considered for each impacted area and those measures that are feasible and reasonable and would "likely" be incorporated into the proposed project. Noise barriers typically present the only feasible and reasonable abatement measures; however, the following traffic control measures (TCM) should be evaluated:

1. Prohibition or restrictions in use of certain vehicle types
2. Modified speed limits
3. Exclusion land use designations having more lenient noise abatement criteria
4. Traffic control devices

f. The factor used to determine if abatement is feasible and reasonable should be discussed, including cases where no prudent solutions exist for identified noise impacts. "Feasible" means that it is structurally and acoustically possible to attenuate traffic noise occurring at a receiver by at least 5 dBA Leq(h). Traffic noise abatement measures include traffic control measures (TCM), alteration of vertical or horizontal alignment, acquisition of buffering land, noise insulation of impacted receivers, and construction of traffic noise barriers. "Reasonable" means that INDOT believes abatement of traffic noise impacts is prudent based on consideration of all the following factors:

i. The number of benefited receivers, those for whom the mitigation will benefit by at least 5 dBA Leq(h) at the noisiest hour conditions. This number is not necessarily the number of receivers impacted.
ii. The cost of abatement on a benefited receiver basis and on a project level basis. The Indiana Department of Transportation has set the acceptable cost per benefited receiver as $30,000.00. This cost should be arrived at by applying a square footage cost basis on the square footage of the noise barrier. A reasonable square footage cost basis will be determined by the Indiana Department of Transportation.
iii. The severity of existing and future traffic noise levels. The absolute level and the increase of the future noise are two aspects with which to assess the severity of the noise impacts.
iv. The timing of development near the project. The state considers it appropriate to give more consideration for development that occurs before initial highway construction.
v. The views of noise impacted residents. Potential negative impacts of noise barriers include unsightliness, shortened daylight, poor air circulation, degradation by weather, reduced safety, vandalism, and restriction of access for emergency vehicles

Where it is desirable to qualify the term "likely", the following statement or similar wording would be appropriate. "Based on the studies completed to date, the State intends to install noise abatement measures in the form of a barrier at (***location(s)***). These preliminary indications of likely abatement measures are based upon preliminary design for a barrier of ___ high and ___ long and a cost of $____ that will reduce the noise level by dBA for ____ (***residences, businesses, schools, parks, etc***). Where there is more than one

barrier, provide information for each one. If during final design these conditions substantially change, the abatement measures might not be provided. A final decision on the installation of abatement measure(s) will be made upon completion of the project design and the public involvement process."

The coordination of the results of the study with local government officials having jurisdiction over the area to be affected is to be carried out in a timely manner. The purpose of coordination is to promote compatibility between residential land development and the proposed highway project. The following information, specified by 23 CFR 772.15, should be furnished to the local officials in the environmental document:

1. Estimated future noise levels at various distances for developed and undeveloped lands in the immediate vicinity of the proposed highway project.
2. Locations nearby that in the future are susceptible to noise impacts if anticipated projects for existing or proposed highways were to be built.
3. Information on eligibility requirements for Federal-Aid participation in Type II projects.

Regarding construction noise, the following should be discussed in the document:

a. The identification of land uses and/or activities which may be affected by noise from construction of the project.

b. A determination of measures in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community. This should include a weighing of the benefits achieved, the overall adverse social, economic, and environmental effects, and the cost of the abatement criteria.